

Collapse behavior of a thermo- and pH-responsive block copolymer in water

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Orthogonally switchable block copolymers show rich phase behavior in aqueous solution. In dependence on temperature and pH, e.g. unimers, core-shell micelles, reverse core-shell micelles or large aggregates may be formed. We investigate a block copolymer with a polybasic pH sensitive block of (diisopropylamino)ethyl methacrylate and a thermoresponsive block composed by a random copolymer of (methoxyethoxy)ethylmethacrylate and oligo(ethylene glycol)methyl ether methacrylate featuring a lower critical solution temperature (LCST)[1]. Micelles will present a core of one or the other block, depending on whether the temperature and pH values are below or above the LCST and the pKa.

The critical micelle concentrations and the micellar hydrodynamic radii are determined by temperature-resolved fluorescence correlation spectroscopy. The structures of the micelles and the aggregates are assessed by small-angle X-ray scattering.

[1] Alves, S. P. C. et al. J. Phys. Chem. B 118, 3192 (2014).

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